

WHAT IS CLAIMED IS:

1. An electrophotographic photosensitive drum  
for use in an electrophotographic image forming  
apparatus and supported rotatably by a drum shaft,  
5 comprising:

a cylinder having an electrophotographic  
photosensitive member provided on the surface  
thereof; and

flanges provided on end portions in the axial  
10 direction of the cylinder, wherein the flange has an  
outer peripheral portion, a hole portion engaging the  
drum shaft and multiple ribs extended radially in  
the radius direction, and the flange is caulked by  
bending part of the cylinder inwardly in the radius  
15 direction at two positions opposing each other across  
the hole portion, the two positions being other than  
positions at which the multiple ribs intersect the  
outer peripheral portion in the extending directions  
thereof.

20

2. An electrophotographic photosensitive drum  
according to claim 1, wherein the flange has a  
concave portion provided in the outer peripheral  
portion and part of the cylinder is bent inwardly in  
25 the radius direction and caulked to the cylinder.

3. An electrophotographic photosensitive drum

according to claim 1, wherein the flange has annular ribs provided between the outer peripheral portion and the hole portion.

5           4. An electrophotographic photosensitive drum according to claim 1, wherein the electrophotographic photosensitive drum is mounted on a process cartridge attachable to/detachable from the main body of the electrophotographic image forming apparatus, and the  
10 electrophotographic photosensitive drum is used for forming an image on a recording medium when the process cartridge is mounted on the main body of the electrophotographic image forming apparatus.

15           5. A process cartridge attachable to/detachable from an electrophotographic image forming apparatus, comprising:

- (i) a cartridge frame body;
- (ii) a drum shaft supported by the cartridge  
20 frame body; and
- (iii) an electrophotographic photosensitive drum supported rotatably by the drum shaft, including: a cylinder having an electrophotographic photosensitive member provided on the surface  
25 thereof; and flanges provided on end portions in the axial direction of the cylinder, wherein the flange has an outer peripheral portion, a hole portion

engaging the drum shaft and multiple ribs extended  
radiantly in the radius direction, and the flange is  
caulked by bending part of the cylinder inwardly in  
the radius direction at two positions opposing each  
5 other across the hole portion, the two positions  
being other than positions at which the multiple ribs  
intersect the outer peripheral portion in the  
extending directions thereof; and

(iv) process means for acting for the  
10 electrophotographic photosensitive drum.

6. A process cartridge according to claim 5,  
wherein the flange has a concave portion provided in  
the outer peripheral portion and part of the cylinder  
15 is bent inwardly in the radius direction and caulked  
to the cylinder.

7. A process cartridge according to claim 5  
wherein the flange has annular ribs provided between  
20 the outer peripheral portion and the hole portion.

8. An electrophotographic photosensitive drum  
for use in an electrophotographic image forming  
apparatus and supported rotatably by a drum shaft,  
25 comprising:

a cylinder having an electrophotographic  
photosensitive member provided on the surface

thereof; and

flanges provided on end portions in the axial direction of the cylinder, wherein the flange has an outer peripheral portion, a hole portion engaging the drum shaft and a groove which engages a fixing pin provided in the drum shaft in a direction of intersecting the drum shaft, the groove being extended in the radius direction and transmitting a driving force of the drum shaft, and the flange is caulked by bending part of the cylinder inwardly in the radius direction at two positions opposing each other across the hole portion, at which the groove intersects the outer peripheral portion in an extending direction thereof.

15

9. An electrophotographic photosensitive drum according to claim 8, wherein the flange has a concave portion provided in the outer peripheral portion and part of the cylinder is bent inwardly in the radius direction and caulked to the cylinder.

20

10. An electrophotographic photosensitive drum according to claim 8, wherein the flange has a rib extended radially in the radius direction on the face of a side opposite to the side on which the groove is provided in the axial direction, and part of the cylinder is caulked at positions other than

25

the positions at which the rib intersects the outer peripheral portion in an extending direction of the rib.

5           11. An electrophotographic photosensitive drum according to claim 8, wherein the electrophotographic photosensitive drum is mounted on a process cartridge attachable to/detachable from the main body of the electromagnetic image forming apparatus, and the  
10 electrophotographic photosensitive drum is used for forming an image on a recording medium when the process cartridge is mounted on the main body of the electrophotographic image forming apparatus.

15           12. A process cartridge attachable to/detachable from an electrophotographic image forming apparatus, comprising:  
            (i) a cartridge frame body;  
            (ii) a drum shaft supported by the cartridge  
20 frame body; and  
            (iii) an electrophotographic photosensitive drum supported rotatably by the drum shaft,  
including: a cylinder having an electrophotographic photosensitive member provided on the surface  
25 thereof; and flanges provided on end portions in the axial direction of the cylinder, wherein the flange has an outer peripheral portion, a hole portion

engaging the drum shaft and a groove which engages a  
fixing pin provided in the drum shaft in a direction  
of intersecting the drum shaft, the groove being  
extended in the radius direction and transmitting a  
5 driving force of the drum shaft, and the flange is  
caulked by bending part of the cylinder inwardly in  
the radius direction at two positions opposing each  
other across the hole portion, at which the groove  
intersects the outer peripheral portion in an  
10 extending direction thereof; and

(iv) process means for acting for the  
electrophotographic photosensitive drum.

13. A process cartridge according to claim 12,  
15 wherein the flange has a concave portion provided in  
the outer peripheral portion and part of the cylinder  
is bent inwardly in the radius direction and caulked  
to the cylinder.

20 14. A process cartridge according to claim 12,  
wherein the flange has a rib extended radiantly in  
the radius direction on the face of a side opposite  
to the side on which the groove is provided in the  
axial direction, and part of the cylinder is caulked  
25 at positions other than the positions at which the  
rib intersects the outer peripheral portion in an  
extending direction thereof.

15. An image forming apparatus which allows a process cartridge to be attached/detached for forming an image on a recording medium, comprising:

(i) a loading portion on which the process  
5 cartridge is mounted detachably;

(ii) a process cartridge loaded on the loading portion, the process cartridge including a cartridge frame body, a drum shaft supported by the cartridge frame body, and an electrophotographic photosensitive  
10 drum supported rotatably by the drum shaft,

the electrophotographic photosensitive drum including: a cylinder having an electrophotographic photosensitive member provided on the surface thereof; and flanges provided on end portions in an  
15 axial direction of the cylinder, wherein the flange has an outer peripheral portion, a hole portion engaging the drum shaft, and multiple ribs extended radially in the radius direction, and the flange is caulked by bending part of the cylinder inwardly in  
20 the radius direction at two positions opposing each other across the hole portion, the two positions being other than positions at which the multiple ribs intersect the outer peripheral portion in the extending directions thereof; and

25 (iii) carrying means for carrying the recording medium.

16. An image forming apparatus which allows a process cartridge to be attached/detached for forming an image on a recording medium, comprising:

(i) a loading portion on which the process  
5 cartridge is loaded detachably;

(ii) a process cartridge loaded on the loading portion, the process cartridge including a cartridge frame body, a drum shaft supported by the cartridge frame body and an electrophotographic photosensitive  
10 drum supported rotatably by the drum shaft, the electrophotographic photosensitive drum including: a cylinder having an electrophotographic photosensitive member provided on the surface thereof; and a flange provided on end portions in the axial direction of  
15 the cylinder, wherein the flange has an outer peripheral portion engaging the cylinder, a hole portion engaging the drum shaft and a groove which engages a fixing pin provided in the drum shaft in a direction of intersecting the drum shaft, the groove  
20 being extended in the radius direction and transmitting a driving force of the drum shaft, and the flange is caulked by bending part of the cylinder inwardly in the radius direction at two positions opposing each other across the hole portion, at which  
25 the groove intersects the outer peripheral portion in an extending direction thereof; and

(iii) carrying means for carrying the recording



medium.

17. An electrophotographic photosensitive drum  
for use in an electrophotographic image forming  
5 apparatus and supported rotatably by a drum shaft,  
comprising:

a cylinder having an electrophotographic  
photosensitive member provided on a surface thereof;  
and

10 a flange provided on an end portion in an axial  
direction of the cylinder,

wherein the flange comprises:

an outer peripheral portion;

a hole portion engaging the drum shaft; and

15 a groove which engages a fixing pin provided in  
the drum shaft in a direction of intersecting the  
drum shaft, the groove being extended in the radius  
direction and transmitting a driving force of the  
drum shaft,

20 and wherein the flange is caulked by bending a  
part of the cylinder inwardly in the radius direction  
at two positions located in a range of the outer  
peripheral portion between a position in which the  
groove intersects the outer peripheral portion in an  
25 extending direction thereof and a position in which a  
line passing a center of the hole portion and  
extending at an angle of 45° with respect to the

extending direction of the groove intersects the outer peripheral portion, the two positions being opposed with each other across a line intersecting the extending direction of the groove.

5

18. A process cartridge attachable to/detachable from an electrophotographic image forming apparatus, comprising:

- (i) a cartridge frame body;
- 10       (ii) a drum shaft supported by the cartridge frame body;
- (iii) an electrophotographic photosensitive drum supported rotatably by the drum shaft, including a cylinder having an electrophotographic
- 15       photosensitive member provided on the surface thereof; and a flange provided on an end portion in the axial direction of the cylinder; and
- (iv) process means for acting on the electrophotographic photosensitive drum,
- 20       wherein the flange includes:
  - an outer peripheral portion;
  - a hole portion engaging the drum shaft; and
  - a groove which engages a fixing pin provided in
- 25       the drum shaft in a direction of intersecting the drum shaft, the groove being extended in the radius direction and transmitting a driving force of the drum shaft,

and wherein the flange is caulked by bending a part of the cylinder inwardly in the radius direction at two positions being located in a range of the outer peripheral portion between a position in which  
5 the groove intersects the outer peripheral portion in an extending direction thereof and a position in which a line passing the center of the hole portion and extending at an angle of  $45^\circ$  with respect to the extending direction of the groove intersects the  
10 outer peripheral portion, the two positions being opposed with each other across a line intersecting the extending direction of the groove.

19. An image forming apparatus which allows a  
15 process cartridge to be attached/detached for forming an image on a recording medium, comprising:

(i) loading portion on which the process cartridge is mounted detachably;

(ii) a process cartridge loaded on the loading  
20 portion, the process cartridge including a cartridge frame body, a drum shaft supported by the cartridge frame body, an electrophotographic photosensitive drum supported rotatably by the drum shaft, process means for acting on the electrophotographic  
25 photosensitive drum, and the electrophotographic photosensitive drum having a cylinder having an electrophotographic photosensitive member provided on

the surface thereof, and a flange provided on an end portion in an axial direction of the cylinder,

(iii) carrying means for carrying the recording medium,

5 wherein the flange being comprises:

an outer peripheral portion;

a hole portion engaging the drum shaft; and

a groove extending in the radius direction and  
engaging a fixing pin provided in the drum shaft in a  
10 direction intersecting the drum shaft and the groove  
transmitting a driving force of the drum shaft,

and wherein the flange is caulked by bending  
part of the cylinder inwardly in the radius direction  
at two positions located in a range of the outer  
15 peripheral portion between a position in which the  
groove intersects the outer peripheral portion in an  
extending direction thereof and a position in which a  
line passing the center of the hole portion and  
extending at an angle of  $45^\circ$  with respect to the  
20 extending direction of the groove intersects the  
outer peripheral portion, the two positions being  
opposed with each other across a line intersecting  
the extending direction of the groove.